



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/802,707	03/08/2001	Mike G. Roemmler	71300P010	7947
8791	7590	12/11/2003		
BLAKELY SOKOLOFF TAYLOR & ZAFMAN 12400 WILSHIRE BOULEVARD, SEVENTH FLOOR LOS ANGELES, CA 90025				
			EXAMINER	
			LISH, PETER J	
			ART UNIT	PAPER NUMBER
			1754	

DATE MAILED: 12/11/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Applicati n No.

09/802,707

Applicant(s)

ROEMMLER, MIKE G.

Examiner

Peter J Lish

Art Unit

1754

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

This action is in response to the Appeal Brief, filed 9/22/03.

#### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-11, 13-21, and 23-27 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Greinke et al. (USPN 5,582,811).

Greinke discloses a method for forming a stable flexible graphite foil structure comprising the steps of intercalating particles of graphite flake, exfoliating the intercalated particles, compressing the particles into a flexible structure or sheet, heat treating the graphite structure and exposing the structure to a stabilizing reagent (column 2, lines 39-55). As in example 1, the graphite raw material may be natural graphite flakes.

The first stage involves intercalating the graphite flakes by dispersing them in a solution containing an oxidizing agent, such as a solution containing nitric acid. The quantity of the intercalation solution may be limited to between 10 to 50 parts of solution per hundred parts of graphite. The intercalated flakes are then exfoliated by quickly heating the flakes, typically in a flame. The exfoliated graphite may then be compressed into flexible graphite sheet or foil. The graphite sheets or foils may then be heated. Greinke teaches that this heat treatment is performed at a temperature above 600 °C (claim 1). As in examples 10 and 11, this heating treatment may

Art Unit: 1754

be accomplished under a vacuum and at temperatures as high as 1700 °C. The graphite may, following the heat treatment or simultaneously with it, be exposed to stabilizing agents such as chlorine gas.

Greinke et al. does not explicitly teach the use of a temperature of at least 1750 °C for the heat treatment. However, the heat treatment is explicitly taught to take place at temperatures of at least 600 °C. Additionally, no upper limit is placed on the temperature that may be used for heat treatment; therefore any temperature above 600 °C is expected to perform the required treatment. Therefore, the teaching of Greinke et al encompasses heat treatment at a temperature of 1750 °C. Alternatively, given that the desired effect of Greinke et al. is achieved at any temperature above 600 °C, and the teaching of a temperature of 1700 °C, it would have been obvious to one of ordinary skill at the time of invention to use a temperature of at least 1750 °C for the heat treatment of Greinke et al., as performing the heat treatment at a higher temperature to achieve the same effect would have been envisioned by one of ordinary skill.

Regarding claims 11 and 21, Greinke teaches that the final heat treatment and stabilizing steps may be performed (in the same manner as above) on the exfoliated worms, before compression, or compacting, to sheets or foils.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greinke et al. as applied to claims 1 and 13 above, and further in view of Junittila (USPN 4,533,086). Greinke does not teach the process of grinding the graphite produced by his method. Junittila, however, discloses a method of grinding graphite materials in order to produce graphite which is ground to a fine particle size, required for lubricants, batteries, pencils, etc. It therefore would be obvious to one of ordinary skill at the time of invention to perform the grinding stage of Junittila on the graphite material of Greinke in order to produce graphite particles suitable for various applications.

Claims 1-11, 13-21, and 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greinke et al (USPN 5,582,811) in view of Matsumoto et al. (USPN 5,505,929).

Greinke discloses a method for forming a stable flexible graphite foil structure comprising the steps of intercalating particles of graphite flake, exfoliating the intercalated particles, compressing the particles into a flexible structure or sheet, heat treating the graphite structure and exposing the structure to a stabilizing reagent (column 2, lines 39-55). As in example 1, the graphite raw material may be natural graphite flakes.

The first stage involves intercalating the graphite flakes by dispersing them in a solution containing an oxidizing agent, such as a solution containing nitric acid. The quantity of the intercalation solution may be limited to between 10 to 50 parts of solution per hundred parts of graphite. The intercalated flakes are then exfoliated by quickly heating the flakes, typically in a flame. The exfoliated graphite may then be compressed into flexible graphite sheet or foil. The graphite sheets or foils may then be heated. Greinke teaches that this heat treatment is performed

Art Unit: 1754

at a temperature above 600 °C (claim 1). As in examples 10 and 11, this heating treatment may be accomplished under a vacuum and at temperatures as high as 1700 °C. The graphite may, following the heat treatment or simultaneously with it, be exposed to stabilizing agents such as chlorine gas.

Regarding claims 11 and 21, Greinke teaches that the final heat treatment and stabilizing steps may be performed (in the same manner as above) on the exfoliated worms, before compression, or compacting, to sheets or foils.

Greinke et al. teach the purification of an intercalated and exfoliated graphite material. While the highest temperature explicitly used in an example by Greinke et al. is 1700 °C, Greinke does not limit the upper boundary of the temperature for this heat treatment.

Matsumoto et al. teach a process for the purification of graphite by the same mechanism, a heat treatment in the presence of a halogen gas and preferably under vacuum. The purification can be improved by largely reducing the container pressure at the temperature of 1800 – 2200 °C (column 5, lines 28-30). It would have been obvious to one of ordinary skill at the time of invention to use the higher temperatures of Matsumoto in the purification step of Greinke et al. in order to improve the purification.

Claims 12 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greinke et al. and Matsumoto et al. as applied to claims 1 and 13 above, and further in view of Junittila (USPN 4,533,086).

Greinke does not teach the process of grinding the graphite produced by his method. Junittila, however, discloses a method of grinding graphite materials in order to produce graphite

Art Unit: 1754

which is ground to a fine particle size, required for lubricants, batteries, pencils, etc. It therefore would be obvious to one of ordinary skill at the time of invention to perform the grinding stage of Junittila on the graphite material of Greinke in order to produce graphite particles suitable for various applications.


### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J Lish whose telephone number is 703-308-1772 until December 11<sup>th</sup> and 571-272-1354 thereafter. The examiner can normally be reached on 9:00-6:00 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached at 703-308-3837 until December 11<sup>th</sup> and 571-272-1358 thereafter. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

PL

  
STANLEY S. SILVERMAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700